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WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT

SECOND MEETING
Jakarta, 27-29 March 1985

WCED/85/5

Item 6.1 of the Provisional Agenda

PROPOSED PROGRAMME OF WORK ON

ENERGY, ENVIRONMENT AND DEVELOPMENT

Second Meeting
Jakarta, 27-29 March 1985 WCED/85/5
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DRAFT WORK PROGRAMME:

ENERGY, ENVIRONMENT AND DEVELOPMENT

Note by the Secretary General

1. The Commission's report on its "Mandate, Key Issues, Strategy and Workplan" clearly recognizes the central role played by energy in acting as an intermediate good in sustaining human and environmental survival and health, and in promoting societal development worldwide.

2. Paragraphs 59-63 (pp. 24-25) succintly couple prevailing energy consumption practices and policies with the generation of many problems relating to human health, environment and development, such as, for example (i) the transport and combustion of carbon fuels with air pollution, environmental acidification, marine oil pollution, potential climate warming, balance of payments and external debt crisis; or (ii) the predominant use of wood fuels by rapidly growing Third World populations with woodland degeneration and loss, land and soil degradation, agricultural shortages, accelerated human migration to rapidly growing cities. The Mandate document also emphasizes that it is much better to anticipate and reduce these problems rather than relying exclusively on curative responses once they have become prevalent.

3. Strategies for prevention or reduction of these problems and for more sustainable energy futures include: changes or modifications in energy usage practices and policies, improving energy end-use efficiency (conservation), and switching to more suitable, preferably indigenous and renewable energy sources (this may mean concentrating on such options as solar, hydropower, wind, biomass, nuclear, etc.).

4. Most of the technical analyses of these problems carried out so far have tended to examine single issues in isolation as 'environmental problems' and how to 'cure their effects' (e.g., the Standard Agenda). The approach adopted by the Commission in the Alternative Agenda suggested that a single policy action may well reduce more than one problem at a time. For example, conservation may reduce acidification, air pollution, and potential climate warming at the same time.

QUESTIONS TO WHICH THE COMMISSION WILL NEED ANSWERS

5. The above approach adopted by the Commission requires answers to a series of questions concerning the supply and demand situation of conventional energy sources and the potential contribution of alternative sources, as well as the environmental, economic and developmental consequences of each of these. In addition to these, other more interdisciplinary questions also have to be raised, which will cut across not only different categories of energy sources, but also disciplines, such as social and physical sciences, politics and sometimes even philosophy. The secretariat is proposing to deal with these questions in the following way:

FOSSIL FUELS

6. Fossil fuels are presently the most important sources of energy in the industrialized countries, and the most important commercial sources of energy in the developing countries. The use of these fuels, however, is responsible for a great deal of air pollution and environmental degradation. In order to be in a position to recommend changes, the Commission must find answers to a number of important questions.

- What are present levels of demand (for different purposes) and supply of oil, gas and coal in the different regions of the world, and how are these levels most likely going to change in the future?
- What are the bases of these forecasts, and how accurate are they?
- What are the implications of these forecasts for the fossil-fuel related environment and development issues of Climate Change, Acid Rain, Air Pollution and Marine Pollution: by region, selected country and urban area?
- What will be the implications for environment and development of higher/lower fossil fuel prices in the future in both industrialized and developing countries?
- What are the strategic options, policies and instruments available to address these issues, either through preventive measures (e.g., reducing demand for fossil fuels through greater energy efficiency), or through the use of low polluting technologies, internalizing the costs of environmental measures, or promoting lifestyle changes, etc.)?
- What are the principal existing forms of international co-operation on these issues and how can and should they be strengthened?
- What are the needs and opportunities for new forms of international co-operation on these issues?

NUCLEAR ENERGY

7. Nuclear Energy could serve as an important source of energy and may be an alternative to fossil fuels, but it raises significant environment and development issues of its own: e.g., waste management, safety and proliferation.

- What are the present and expected future levels of nuclear energy capacity, globally and by region?
- Does the state-of-the-art now provide the technology and know-how to design and operate nuclear reactors and to manage low- and high-level radioactive wastes in environmentally responsible and economically viable manner?
- What are the sources of the widespread public anxiety about nuclear power and how can or should they be dealt with? In particular, how can one deal with the question of how safe is safe enough?
- What are the implications for environment and development of providing large numbers of small, reactors on a turnkey basis?
- What are the principal existing forms of international co-operation on these issues, and how can and should they be strengthened?
- What are the needs and opportunities for new forms of international co-operation on these issues?

RENEWABLE ENERGY

8. Renewable energy, especially biomass provides fuel for the majority of humankind. Its exploitation, however, is becoming unsustainable in many parts of the world, particularly in the tropics. At the same time, along with nuclear power, renewable energy sources are the only long-term alternatives to conventional energy sources.

- What are the present and expected future levels of consumption of renewable energy sources in different regions and countries?
- What are the main causes of the deterioration of the biomass base, and especially forests, in some developing countries?
- How can the deterioration of the biomass base in the developing countries be stopped and reversed?
- Once achieved, how can bioenergy conversion methods be modernized to increase energy supplies at rates higher than population growth in environmentally sustainable ways?
- What are the main constraints on, and opportunities for the increased use of renewable energy sources in various countries, and how can they be modified?
- What are the implications of larger scale use of renewable energy sources, in terms of land requirements, competition with food production, soil quality, etc.?

- What are the available technical and institutional options to increase the production of food and biomass-based energy at the same time?
- Is there a need for fundamental changes in the attitudes toward, and policies governing renewables in order to achieve a significant increase in their sustainable use?
- What forms of international co-operation, other than scientific and technical exchange, could effectively promote the development and use of renewable energies on a sustainable basis?

MANAGING THE ENERGY TRANSITION

9. If a change is desired in the way energy is consumed and supplied, the change will have to be initiated, helped along and monitored - in other words managed. Economic policies of various kinds are considered to be effective tools for the management of both energy supply and demand.

- What are the available fiscal and other economic policies for the management of energy demand and supply in environmentally favourable ways?
- How effective are they, and how predictable are their impacts?
- What are the implications of their use on the rest of the economy? In particular, of subsidizing an energy source or an energy system?
- What measures are available for demand management in areas with partially- or non-monetized economies, such as most rural areas of developing countries?
- Is there any role for energy demand management on a global basis, and if so, how could it be done?

10. Higher energy conversion efficiencies imply less energy demand and lower environmental impacts. Recent trends indicate the possibility of decoupling economic growth and growth in energy consumption.

- Under what conditions can such decoupling take place, and how far can it go?
- What are the sectors where the greatest impacts can be achieved?
- What are the technical, economic and institutional constraints to higher energy efficiency, particularly in the lower income countries?

11. In developing countries energy planning is particularly difficult due to a number of constraints, including the acute need for crisis management, the multitude of energy sources being used, the existence of non-monetized sectors, etc.

- What are the main technical, economic and institutional constraints to more effective accounting of available resources and to longer term planning?

- How can partially- or non-monetized sectors be included in the planning process?

12. Transportation is major consumer of energy in the industrialized countries, and is responsible for much of commercial energy consumption in developing countries. It is also a major polluter.

- What are the available national, regional and international means to set and enforce automotive exhaust levels? How effective are they? Do they need strengthening? Is there need for new forms of cooperation on this issue?
- What short- and long-term technical and institutional strategies are available to comply with such emmission standards?
- Is there need for a radical rethinking of transportation, in the context of human settlements?

13. International aid, scientific and technical exchange, technology transfer and other forms of international cooperation play an important role in assisting the energy transition, particularly in developing countries.

- What are the existing forms of international cooperation on energy development?
- What are their financial, political and institutional limitations?
- How can they be strengthened, and is there need for radically new forms of international cooperation on these issues?
- How can multilateral and bilateral aid be made more responsive to local needs?

DRAFT PROGRAMME OF WORK

14. These questions will be developed via a number of synoptic Issue Papers, grouped under four headings: Fossil fuels, Nuclear Energy, Renewable Energy, and Managing the Energy Transition. Finally the Energy Advisory Panel will synthesize its thinking in a paper under the heading Energy Strategies for Sustainable Development (See the attached chart).

1. Fossil Fuels

15. This work will examine the range of demand vis à vis the continuing need for oil in the industrialized and developing countries. Coal and natural gas substitution prospects will be considered. This will provide a framework in which to discuss carbon fuel problems: CO_2 and potential climatic change; acid precipitation; air pollution. Ranging through policy measures at the global and regional to local levels, this work will have to examine the main strategic options and policy instruments available to address these issues.

2. Nuclear Energy

16. This work will cover the technical and socio-political questions that have arisen over the siting, licensing and operating of nuclear power stations in the last 20 years. It will also deal with the development of small reactors, often available on a turnkey basis for either electricity production or as a source of district heating. The arrangements currently being made for the disposal of civilian high-level radioactive waste will also be addressed. The work should put energy risk management problems in a clearer perspective and raise policy proposals for improving accurate public perception of risks of nuclear plant operation and nuclear waste disposal.

3. Renewable Energy

17. This work will explore the nature and scale of growing shortages of woodfuels in the Third World. Different strategies for increasing the resource base, and using more efficiently existing resources will be discussed. It examines modern progress with biomass based fuels, including some of the advanced bio-conversion techniques, and their implications, and it will discuss the future role of hydro, solar and other forms of renewable energy. Overall, it will examine how far we are likely to be able to promote renewable energy systems sensibly in the future and by what policies.

18. The interactions between food production and energy are many and complex and closely interact with population growth and urbanization. Hence, this work will also evaluate the trade-offs between subsistence agriculture and cash-crops for export (often needed to buy imported oil for transport) and how this affects rates of urbanization?

4. Managing the Energy Transition

19. This work will deal with some of the more important issues of energy management. It will discuss the role of economic policies in the management of energy supply and demand. It will evaluate the potentials of energy efficiency and conservation measures, and it will deal with problems that developing countries are facing in trying to plan energy developmen, examining policies designed to build indigenous capacity to handle energy management. Different energy accounting systems will be looked at, including their limitations and potentials.

20. As regards transportation, it will evaluate various technical and institutional options available to reduce automotive exhaust levels, increase engine efficiencies, as well as more radical possibilities, such as redesigning the urban-residential space, including highly efficient public transportation systems, etc.

21. Finally, the work will evaluate the present role of international cooperation in energy development, and how these could be strengthened. Particular attention will be paid to aid agencies, the process of technology transfer and various forms of technical and scientific exchange.

5. Energy Strategies for Sustainable Development

22. The Panel's report will summarize the issues considered above, synthesizing them into policy conclusions and recommendations for consideration by the Commission. This substantial paper will be heavily referenced, and will represent the views and recommendations of the Advisory Panel on Energy.

TIMETABLE OF WORK

23. Although the Energy Advisory Panel will receive useful ideas and information from public hearings arranged largely to coincide with meetings of the Commission and from unsolicited reports, a process designed to generate the work outlined above has commenced and should be completed by November 1985. These issue papers are primarily designed to serve as a resource for the Energy Advisory Panel in their writing of the synthesis document on global energy futures, the document which will form the basis of the Commissions 'chapter' on energy. They will, however, be made available to the Commission if it so wishes, approximately one month after they have been seen by the Energy Advisory Panel.

WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT

Energy, Environment and Development

Co-ordinator: K. Kato, J. Pasztor Special Advisor: Gordon Goodman

The Energy Programme will be guided by an advisory panel of senior officials and experts. Consultations on the Chairman and other members of the Panel are continuing and the Commission will be advised as soon as possible.

ISSUE PAPERS	POSSIBLE ASSIGNMENT	CO-OPERATING INSTITUTIONS	COMPLETED BY		REPORT TO
1. Fossil Fuels					
1.1 The Future of Oil, Coal and Gas: Opportunities and constraints.	Oystein Noreng Bekkestua, Norway M. Chadwick, Beijer M. Lönroth, FSI, Sweden	IIASA, Beijer, IEA Institute of Gas Technolgy, USA. EEC, Shell UK.	October	85	AP
1.2 CO_2, Trace Gases and Climatic Change	Ken Hare, Trinity College, Canada	IMI, WRI, IIASA Beijer, WMO	October	85	AP
1.3 Acid Rain	Ian Torrens, OECD	IIASA, NAS, OTA	May	85	AP
1.4 Air Pollution					
1.4.1 Regional Study	AIT, Bangkok		May	85	AP
1.4.2 Regional Study	CETESB (Sao Paulo)		May	85	AP
1.4.3 Regional Study	IIUG (FRG)		May	85	AP
1.4.4 Regional Study	Hasimoto (Japan)		May	85	AP
1.4.5 Regional Study	T. Mathew, India		May	85	AP
1.4.6 Synthesized Air Pollution Study	??		October	85	AP
1.5 Marine Pollution by Oil	Keckes, Szekely - UNEP	IMO, OCAPAC (UNEP)	October	85	AP
2. Nuclear Energy					
2.1 Safety of Nuclear Reactors and of the Nuclear Fuel Cycle	IAEA, ICRP ?		October	85	AP
2.2 Public Acceptance of Nuclear Power	Roger Kasperson CENTED, USA.	IAEA, Union of Concerned Scientists	October	85	AP
2.3 Radioactive Waste Management	Janos Pasztor	IAEA, ICSU	June	85	AP
2.4 Small Nuclear Reactors	Joseph Egan Columbia U., NY.		October	85	AP

ISSUE PAPERS	POSSIBLE ASSIGNMENT	CO-OPERATING INSTITUTIONS	COMPLETED BY		REPORT TO
3. Renewable Energy					
3.1 Renewable Energy, Environment and Development (Including Fuelwood and Charcoal, Bioenergy and Others)	Janos Pasztor	Beijer, IIED, ITDG CEMAT, CATIE, WRI TATA, SERI	May	85	AP
3.2 Energy and Food Supply	Gerald Leach, IIED	Colegio de Mexico IITA, World Food Ctr.	October	85	AP
4. Managing the Energy Transition					
4.1 Pricing Policies,Energy and Development	Göran Ohlin, United Nations	IIED, SPRU Dakar Dev. Inst.	October	85	AP
4.2 Energy Efficiency and Societal Productivity	Gerald Leach, IIED T. Johansson, Lund U.	Princeton Univ.	October	85	AP
4.3 Energy Planning for Development	Paul Raskin ERSG, Boston, USA	Beijer, IIED World Bank	October	85	AP
4.4 Transportation Systems	???	OECD	October	85	AP
4.5 Energy and International Cooperation	Kurt Hoffman, SPRU	RFF, WRI, IIASA	October	85	AP
5. Energy Strategies for Sustainable Development					
5.1 Energy Advisory Panel's Report and Recommendations to the Commission	Writers from IIED		June	86	WCED